

# Space Stepping

## Teachers spend time at JSC learning space technology



*(Editor's note: Danita McDonald participated in JSC's Summer Teacher Enhancement Program, or STEP. She worked as an instructor assistant during the 1996 STEP workshop. McDonald is a teacher and lives in Kirtland, N.M. The following is her interpretation of the workshop.)*

By Danita McDonald

The second annual Summer Teacher Enhancement Program, or STEP, workshop was an educational experience in which teachers learned about the International Space Station and space technology.

JSC's Educational Outreach Program and Biological Sciences Curriculum Studies from Colorado Springs, Co., sponsored the workshop, doing their best to create an experience in which teachers could become knowledgeable about the space station and space technology, and translate some of that information into the classroom. The workshop consisted of classroom instructions and tours of JSC facilities.

Teachers were allowed access to Bldg. 9, and the expertise of the engineers, contractors and other personnel in the mock-ups. Teachers performed tasks while riding in a chair on the Precision Air-Bearing Floor. This experience opened many eyes and minds to the workings of astronauts in a microgravity environment. It also gave the teachers first-hand information to better explain these situations in a classroom.

Teachers sat in the cockpit of the Full Fuselage Shuttle Trainer and were treated to a complete briefing on the Robotic Arm, from how the arm is stowed in the payload bay to how it functions in space. Some of the other experiences at JSC were in the hypo and hyperbaric chambers, where the teachers learned about oxygen hypoxia and the dangers of air travel in a micro-gravity environment. A trip through the Space Environment Simulation Lab topped off the tour.

In addition, a classroom lecture by Mike Fox about Human Physiology in Space really sparked understanding and appreciation for the amount of research and precautions taken in studying and preparing for space travel. Vickie Kloeris briefed teachers on their visit to the shuttle food lab. Kloeris explained how the menus and meals were prepared for space travel, and how the food items were stowed on board. She also talked about the collabora-

tive efforts of meal planning between the Russian Space Program and NASA.

Teachers commented that one of the most interesting and interactive activities was the Neutral Buoyancy Laboratory. After visiting the Sonny Carter Training Facility and the Weightless Environment Training Facility, the teachers experienced simulated weightlessness and neutral buoyancy themselves. The teachers were briefly instructed in the guidelines of scuba-diving, and went into a swimming pool where they were equipped and weighted to create a neutrally buoyant situation. While working in teams, teachers were tasked to build a structure using PVC pipe.

"We take our mobility and our environment very much for granted, and have no idea how



Exploration Data Bases in a unique way—promoting exploration and input of the data bases via a contest amongst the teachers.

In the electronic classroom, teachers explored a variety of ways to incorporate space studies, space exploration and related technologies into various curricular study areas. While science and math are the obvious and most easily integrated areas, teachers investigated ways to include social studies and English. The implications of cultural exchange and societal comparisons between the contingents of the space program provide an opportunity to delve into the history of the space program. Comparisons of the alliances between countries, as well as past and present political struggles and relations, also lend

much to the social studies area. In the areas of language arts and English, creative stories and essays were the subject of discussion, as well as biographical studies of the astronauts and other interesting people. It was decided unanimously amongst the workshop participants that including the areas of space studies

and space exploration in the classroom could do nothing but enhance the current requirements of the education system. The level of excitement rose as the teachers became more and more involved in the workshop.

Along with brainstorming ideas on how to incorporate the space program into the current school curricula, the on-site Teacher Resource Center and the Information Services Center of JSC played a large part in providing the teachers with classroom and support materials on which to base their programs. According to the teachers, one of the best things about the materials is that they all come ready to use in the classroom, complete with approved objectives and support materials. Video tapes come with teacher's guides and related activities, so there is very little extraneous effort required to use the materials in class.

"NASA and JSC have really tried to make the classroom materials user-friendly, and they seem to understand that teachers don't have a lot of time to rewrite their lessons and curricula," said Patti Hendricks of Russell Middle School in Colorado Springs. "Knowing that the materials are immediately

ready for use in the classroom makes me more eager to use them in my lesson plans. I have already found several activities on space and the moon that will fit into my science lessons beautifully."

The resources the teachers collected at the STEP workshop did not end with support materials from the Teacher Resource Center. The guest speakers, engineers, contractors and astronauts also presented the workshop participants with a valuable connection—their e-mail addresses. Many of the teachers felt this was a personal connection that would definitely help them to research information, as well as a way to have their students become involved.

"Many workshops you attend have paid presenters who speak as a means to an end, such as a livelihood," said Trisha Martinez of Center, Co. "I felt that the presenters and speakers we experienced in this workshop were genuinely interested in what we were doing in the classroom and were eager to be a part of it. For me, this makes me want to go home and get back to work, knowing someone as important as an astronaut in the NASA space program feels that what I do is important."

The ideas behind the workshop stem from NASA's Strategic Plan for Education, and from goals of JSC's Public Affairs Education Branch. The purpose of this workshop was to "promote excellence in America's educational system through enhancing and expanding scientific and technological competence."

Incorporating the facilities of a scientific and technological research center such as JSC allows for outstanding transfer of information and experience technology to teachers on a first-hand basis.

One of the greatest challenges for teachers is staying current with information and technology, and then delivering this current information in the classroom. The STEP program has been instrumental in answering this challenge by allowing the selected teachers to experience first-hand technology and information about space exploration and travel, and also by creating for them alliances to maintain this sharing of information.

One of the requirements of participation in the STEP program is telecommunication via the Internet with the participants and instructors over the course of the following academic school year. The STEP organizers provided each participant with a Spacelink educator's account so that the teachers could communicate. STEP organizers also ensure cooperation and support of school districts so teachers can continue to participate in the program once back at school. It is the belief of STEP organizers that teachers must be able to connect with the information that is available and present it to the students in their classrooms.

Utilizing NASA's Strategic Plan for Education to enhance teacher content knowledge, skills and experiences, the STEP program incorporates science and curricular support from the organization of Biological Sciences Curriculum Study.

For most, the STEP workshop was an educational opportunity that was well worth the weeks spent away from homes and families. It was an experience that will be held dear as far as friends made and people met, and it was an opportunity for professionals to share ideas and promote each other. This is one of the few times when teachers are made to feel that what they do in their classroom is on the same level as what the most technologically-advanced scientists are doing. The basic premise is, without education, there is no advancement, and if advances are desired, education is paramount. By supporting education and educating teachers, we ensure our nation's success in our endeavors, whatever they may be and where ever they may take us, for the future. □



Photos by Danita McDonald

From top to bottom, left to right: 1) Teacher participants take a break during a tour of the Bldg. 9 mockups. The group was briefed on living and working in space, one of the workshop's classroom activity topics. The briefing was one of the many activities the teachers did during the two and a half week workshop. 2) JSC's Phil West, spacesuit expert, demonstrates the spacesuit astronauts use for work outside the shuttle during missions. 3) Teachers get "hands-on" training on the precision air bearing floor. 4) Teachers examine spacesuit hardware as part of their "Suited for Space walking" classroom activity.